

REMARKS

Claims 1, 4, 6-10, 14-17 and 20-25 are pending in the application, and are rejected. Claim 8 is herein canceled. Claims 1, 7, 14, 16-17 and 20-25 are herein amended. No new matter has been entered.

Applicants note that the specification on page 4, lines 8-11 indicates that “the colorant is dissolved/dispersed in the copolymer, is *adsorbed* onto/coats the surface of the copolymer, or is dispersed at random with the copolymer in the solvent.” The claims currently indicate that the colorant is “*absorbed*”. Therefore, Applicants herein amend claims 1, 14, 16, 17 and 20 to recite that the colorant is “~~absorbed~~ adsorbed” onto the surface of the copolymer. The support for the amendment indicated therein is disclosed on page 4, lines 8 to 11 of the original specification.

Claim Rejections - 35 U.S.C. §112

Claims 1, 4, 6-10, 14-17, and 20-25 are rejected under 35 U.S.C. §112 first paragraph, as failing to comply with the written description requirement.

The Examiner notes that claims 1, 14, 16 and 17 recite that the polymer is obtained from 10 through 80 wt% “alkyl acrylate, alkyl methacrylate, substituted or unsubstituted acrylate, or substituted or unsubstituted alkyl methacrylate”. The Examiner asserts that although there appears to be support for hydroxyl, amino, and ammonium substituents, there does not appear to be support for all possible substituents.

Applicants respectfully disagree with this rejection, and note the description on page 11, lines 19 to 27, which generally describes unsubstituted alkyl, hydroxy substituted alkyl, amino

substituted alkyl, and ammonium substituted alkyl compounds, and specifically describes hydroxyl, amino, and ammonium substituents. Nevertheless, Applicants herein amend claims 1, 16 and 17 to recite “wherein substituents are at least one selected from the group consisting of hydroxyl, amino, and ammonium substituents”. Applicants submit that this amendment renders the rejection moot.

The Examiner further asserts that there is no support in Table 1 for “substituted or unsubstituted acrylate” given that all the acrylates disclosed are alkyl acrylates. Applicants herein amend claims 1, 14, 16 and 17 to change “acrylate” to “alkyl acrylate”.

The Examiner notes that claims 1, 14, 16, 17, and 20 have each been amended to recite “wherein said colorant is dissolved or dispersed in said copolymer particles or dispersed in said solvent with said copolymer particles by absorption on or coating a surface of said copolymer particles, but said colorant is not dissolved in the solvent”. The Examiner asserts that although there is support for the recitation that the colorant is dispersed in the solvent or the colorant is absorbed on or coating a surface of the copolymer, there is no support to recite that the dispersion of the colorant in the solvent is due to absorption on or coating of the copolymer surface with the colorant.

Applicants strongly disagree with the rejection, and note that if the colorant is adsorbed onto the copolymer particles, and the copolymer particles are dispersed throughout the solvent, then the colorant particles are *inherently* dispersed throughout the solvent, and they are clearly dispersed *because they are adsorbed on the copolymer particles* which are themselves dispersed throughout the solvent. An analogy would be that automobile drivers are dispersed throughout a

city because the cars they are driving in are dispersed throughout a city. In such case, the dispersion of the drivers in the city is due to occupancy in the cars of the drivers. Applicants therefore traverse this rejection.

Claims 1, 4, 6-10, 14-17, and 20-25 rejected under 35 U.S.C. §112, second paragraph for being indefinite. The Examiner asserts that claims 1, 14, 16, and 17 each recite that the copolymer is obtained from 10 through 80 wt. % alkyl acrylate, alkyl methacrylate, “substituted or unsubstituted acrylate, or substituted or unsubstituted alkyl methacrylate”. The Examiner asserts that the claim is confusing because it is not clear what the difference is between alkyl methacrylate and unsubstituted alkyl methacrylate.

Applicants herein amend claims 1, 14, 16 and 17 to delete the phrase “alkyl acrylate, acrylate or alkyl methacrylate”.

Claim 8 is rejected because claim 8, which depends on claim 1, recites that the colorant is dissolved or dispersed in said solvent while claim 1 recites that the colorant is not dissolved in said solvent. Applicants herein cancel claim 8.

Claim Rejections – 35 U.S.C. §103

Claims 1, 4, 6-10, 14-17, and 20-25 are rejected under 35 U.S.C. §103 (a) as being unpatentable over Nguyen et al. (U.S. 6,248,805) in view of Patel et al. (U.S. 5,977,210) and Fujisawa et al. (U.S. 5,997,136).

The Examiner asserts that although there is no explicit disclosure in Nguyen et al. that the surfactant covers a surface of the copolymer, given that the surfactant and copolymer are mixed

together in Nguyen et al. (examples), it would have been natural for one of ordinary skill in the art to infer that the surfactant intrinsically covers a surface of the copolymer.

The Examiner asserts that Nguyen et al. disclose an ink jet ink comprising (i) 0.1-10% polymer which has the structure ABC where A is a hydrophobic monomer such as alkyl (meth)acrylate, B is a hydrophobic monomer such as styrene, and C is a monomer that has a polar functional group including (meth)acrylic acid, (ii) solvent which is liquid at room temperature, and (iii) colorant which is a dye or pigment wherein the colorant is dispersed in the polymer.

The Examiner asserts that Applicants' arguments filed 6/20/05 have been considered but are not persuasive. The Examiner notes that Nguyen et al. disclose the use of pigment or water-soluble or water-insoluble dye (col. 19, line 62 and col. 20, line 42); therefore, if the dye is of a different solubility type than the solvent, the colorant will not dissolve in the solvent. The Examiner further points to col. 5, lines 19-20 and col. 26, line 65- col. 27, line 8, which disclose that the colorant is dispersed in the copolymer. Additionally, the Examiner asserts that there is no direct disclosure in Nguyen et al. that the colorant is *dissolved* in the solvent. The Examiner concludes that Nguyen et al. meets the above-cited limitation found in the present claims regarding the colorant.

Applicants note that in order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the

art, to modify the reference or to combine reference teachings. Finally, there must be a reasonable expectation of success. (Manual of Patent Examining Procedure §2142). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicant's disclosure.

With respect to claims 21-25, Applicants herein amend the claims and remove reference to vinylpyridine. Thereafter, Applicants disagree with the rejection because not all of the claimed elements are met by the cited reference.

With respect to the rejection of claims 1, 4, 6-7, 9-10 and 14-17, Applicants respectfully disagree with the above rejection because not all of the claimed limitations are met by the cited combination of references.

Applicants note that an object of the present invention is to provide a high-quality image having good color reproducibility by reducing the blurring, improving the quick-drying property, and improving the fixing property. Other objects of the present invention are to provide ink having the excellent preservation stability, and to provide the ink cartridge and the recording device for the ink. In view of these objects, the ink according to the present invention includes a primary particle of a copolymer obtained from a radical polymeric monomer, a coolant, and a solvent that is liquid at room temperature, as recited in claim 1.

The present invention has the following features, which are described on page 4, lines 8 to 11 of the original specification.

“According to the ink, ink cartridge and recording device of the present invention, the colorant is not dissolved in the solvent due to the copolymer particle. More specifically, the

colorant is dissolved/dispersed in the copolymer, is adsorbed onto/coats the surface of the copolymer, or is dispersed at random with the copolymer in the solvent.”

Compared to the related art, the present invention with the above-mentioned features has the following particular effects, which are described on page 4, lines 12 to 20 of the original specification.

“Consequently, when the ink is applied to the recording medium that is in general use, the solvent penetrates into the recording medium but the colorant does not penetrate into the recording medium, therefore producing no blur. On the other hand, the copolymer particle and the colorant remaining on the surface of the recording medium thereafter combines to form a filmy shape and is stably fixed on the recording medium. This film shaping begins automatically (usually at room temperature) when the solvent penetrates into the recording medium (self-film-shaping)...”

On the other hand, with respect to the invention of Nguyen et al., Applicants admit that it might be true that a water-insoluble dye would not dissolve in water as a solvent, but might form a suspension. However, Nguyen et al. do not teach the mere use of water as a solvent. Rather, Nguyen et al. teaches a mixture of water with a water-miscible organic cosolvent (column 22, lines 14-22). Applicants submit that such a mixture would inherently dissolve any of pigment, water-soluble dye or water-insoluble dye. The result would be dye that is dissolved in the solvent, which is quite different from the present invention. Therefore, Applicants submit that even if the cited references were properly combined, the present invention would not be reached.

In addition to the above-described differences between the present invention and the related art, Applicants particularly emphasize the following differences concerning the volume average particle diameter. Even if the particles that are produced according to the emulsion polymerization based on Nguyen et al. (U.S. Patent No. 6,248,805) are within the range of the volume average particle diameters described on page 7, lines 17 to 18 and on page 9, lines 11 to 12 of the original specification, the produced particles are not necessarily 0.05 through 1 μm in volume average particle diameter, and particles being under 0.05 μm or over 1 μm in volume average particle diameter can be produced. Hence, the particles that are produced according to Nguyen et al. (U.S. Patent No. 6,248,805) do not satisfy the presently claimed range of the volume average particle diameters set forth in claims, and do not have the same effects as the particles based on the present invention.

In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

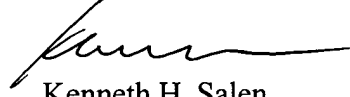
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If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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